

ECE 3656 Mobile and Wireless Networks
Spring 2002

Homework 4: Due in class Mon May 13 2002

- This test contains 1 problem. It allows you to earn 100 points.
- The solution to this problem should be a hard copy of the required program and also a floppy disk containing the C/C++ code. Show your work, as partial credit can be given. You will be graded not only on the correctness of your answer, but also on the clarity with which you express it. **Be neat.**
- **No late submissions will be accepted.**
- Only homework returned in a letter size envelope will be accepted. Please, write your name and the class name (ECE 1320) on the envelope (write clearly, please). Also, write your name and the class name in the floppy disk.

Write your name here: _____

Problem # 1 [100 points]. This homework is related to the project as described in the handout distributed in class (see also the class web page). You are requested to write a program with the following characteristics. **Input:** the number n of nodes of a wireless network, the nodes transmission radius r , the side L of the (geographic) cube necessary to obtain a high percentage of connected topologies, and the coverage requirement r_u of each white node u (r_u should be 1, 2 and 3). **Output:** two values n_r and n_w such that $n_r + n_w = n$ and such that if n_r red nodes and n_w white nodes are randomly and uniformly scattered in the cube of side L we obtain a topology that has a *feasible solution* for the “Politburo problem” with high probability (> 0.8). A topology has a feasible solution for the Politburo problem when each white node u has at least r_u red neighbors.